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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/775,702	02/09/2004	Ikuya Yagisawa	16869N-104800US	9171

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TOWNSEND AND TOWNSEND AND CREW, LLP
TWO EMBARCADERO CENTER
EIGHTH FLOOR
SAN FRANCISCO, CA 94111-3834

EXAMINER

BRADLEY, MATTHEW A

ART UNIT PAPER NUMBER

2187

DATE MAILED: 08/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/775,702

Applicant(s)

YAGISAWA ET AL.

Examiner

Matthew Bradley

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 2/09/2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 22-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 22-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>2/09/04 & 9/13/04</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

The information disclosure statement (IDS) submitted on 9 February 2004 was filed on the filing date of 9 February 2004 for application 10/775,702. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the Examiner.

The information disclosure statement (IDS) submitted on 13 September 2004 was filed after the filing date of 9 February 2004 for application 10/775,702. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the Examiner.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 22-30 are rejected under 35 U.S.C. 102(b) as being anticipated by Matoba (U.S. 5,611,069).

As per independent claim 22, Matoba teaches,

- a plurality of disks including first type disks configuring a RAID group and at least one second type disk, wherein each of the first type disks store one of data received from a computer coupled to

the storage system or parity data used for recovering the data received from the computer, and wherein the at least one second type disk is used as a spare disk for storing copy data of data stored in one of the first type disks; and (Column 4 lines 4-36) *The Examiner notes that Matoba teaches a mirror disk setup which is constructed to form an array of disks to store data. As shown in Figures 1A and 1B, the system has a plurality of disks that are used for this array construction. Further, parity is taught by Matoba in line 8 with the recitation of "write data from an upper apparatus was striped" and with the usage of RAID3 or RAID5 (Column 6 line 2) parity is inherent.*

- a control section configured to hold an error status of each of the first type disks, start to mirror data between one of the first type disks and the at least one second type disk when the error status of the one of the first type disks matches a predetermined first criterion, (Column 6 lines 4-15). *The Examiner notes that Matoba teaches a "control section" that allows for the "switching" when errors or faults are detected.*
- wherein, after starting to mirror data between the one of the first type disks and the at least one second type disk, the control section is configured to stop mirroring data between the one of the first type disks and the at least one second type disk and start to mirror data between another one of the first type disks and the at least one

second type disk, according to the error status of the one of the first type disks and the another one of the first type disks. (Column 6 lines 25-45). *The Examiner notes that the control section of Matoba "copies the storage data of the disk unit in which the fault was decided into the spare disk unit."*

As per dependent claim 23, Matoba teaches, "the control section is configured to compare the error status of each of the first type disks, and based on the result of error status comparison between the one of the first type disks and the another one of the first type disks, the control section is configured to stop mirroring data between the one of the first type disks and the at least one second type disk and start to mirror data between the another one of the first type disks and the at least one second type disk" (Column 6 lines 4-45). *The Examiner notes that as discussed supra in the teachings of Matoba, the system of Matoba continuously checks for errors and when errors are abound, the system switches to different disks for writing.*

As per dependent claim 24, Matoba teaches, "when the error status of one of the first type disks matches a predetermined second criterion, the control section is further configured to stop mirroring between the one of the first type disks and the at least one second type disk and configure a RAID group including the at least one second type disk instead of the one first type disks" (Column 6 lines 4-62). *The Examiner notes that as discussed supra, the system switches to a different set of disks for writing upon meeting certain criteria . Additionally, Matoba teaches the 'second criterion' of the instant claim with the recitation of "a*

timing corresponding to the half of the threshold value (column 6 line 55).” This halving of the threshold value represents two values for which the system of Matoba can act upon. Accordingly, the system of Matoba teaches the limitation of “second criterion” by relying on a half of the threshold value instead of the original threshold value.

As per dependent claim 25, Matoba teaches, “wherein the error status of each of the first type disks is error count of each of the first type disks, and both of the predetermined first criterion and the predetermined second criterion are predetermined values of error count” (Column 4 line 57 to column 5 line 12).

As per dependent claim 26, Matoba teaches, “wherein the value of error count for the predetermined first criterion is zero, whereby the control section is configured to mirror data between the one of the first type disks and the at least one second disk initially” (Column 3 lines 38-61). *The Examiner notes that the teachings of Matoba also allow for a system that continuously mirrors data. This variation of Matoba omits the error checking subsystem, thus, this variation anticipates the instant claim.*

As per dependent claim 27, Matoba teaches, “wherein the error count for the first criterion is updated according to the change of the error status of the first type disks configuring a RAID group” (Column 12 lines 30-37). *The Examiner notes that the “abnormality counter” of Matoba is “increased by 1” for each error.*

As per dependent claim 28, Matoba teaches, “wherein the error status of each of the first type disks is error count of each of the first type disks, and when the error count of the another one of the first type disks becomes larger than the

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error count of the one of the first type disks, the control section is configured to stop mirroring data between the one of the first type disks and the at least one second type disk and start to mirror data between the another one of the first type disks and the at least one second type disk" (Column 12 lines 37-52 further shown in Figure 9B S11 through S14).

As per dependent claim 29, Matoba teaches, "wherein information indicating a pair of disks configuring a mirroring pair is output from the storage system to a management computer coupled to the storage system" (Column 11 lines 29-65).

As per dependent claim 30, Matoba teaches, "wherein the predetermined first criterion is updated based on the error status of the first type disks configuring a RAID group" (Column 12 lines 12-52).

Conclusion

The prior art made of record and not relied upon are as follows:

1. U.S. Patent No. 6,615,314 Higaki et al. teach a disk array storage system.
2. U.S. Patent No. 6,154,853 Kedem teaches a disk storage system able to change from a mirrored embodiment to a RAID configuration.
3. U.S. Patent Application Publication 2002/0065999 Kikuchi et al. teach an error based back- up system.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew Bradley whose telephone number is (571) 272-8575. The examiner can normally be reached between 6:30-3:00 M-F.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Donald A. Sparks can be reached on (571) 272-4201.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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CHRISTIAN CHACE
PRIMARY EXAMINER